



# STANFORD UNIVERSITY MEDICAL CENTER

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STANFORD UNIVERSITY SCHOOL OF MEDICINE  
Department of Genetics

AUG 13 1969

Dr. Glenn Seaborg  
Chairman, AEC

Dear Dr. Seaborg:

I hope it is possible for this to reach your early attention. The article is intended for publication in the Washington Post next Saturday: if I am far off the beam, and had a call from you about it, I would gladly pull it back. I did make an honest effort at fair appraisal of the situation, and I would have to share some responsibility for not having looked more closely at it sooner.

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(1) In fact I was quite surprised that Luning's rather inconclusive work has been the only confrontation with quantitative measurements of genetic hazards from Sr-90. I was astonished not to find any studies on mutation yield, say in bacteria; and I called Ed Lewis, who reminded me that no-one would have seen any merit in doing anything but emitted radiation calculations for effects of a bone-seeker. So he never advocated such a thing for Drosophila.

(2) However, Muller points out that the measured radioactivity in testis in a Luning-style experiment is larger than calculated, and attributes this to the localization of Y-90 therein. I have seen some studies on Y-90 distribution, and find it is somewhat concentrated in pituitary, liver, and gonads, especially ovarian follicles. The autoradiographs were not reproduced well enough for me to tell whether there is nuclear localization of the Y-90 in follicle cells -- but there is some hint of it. I found nothing on the complexing of DNA with yttrium, but you will admit this is not chemically implausible.

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(4) While I am on the general subject, I want to bring to your attention that the natural processes of DNA repair probably do not operate at full efficiency in every individual, so that a small part of the population must bear a disproportionate part of the radiation hazard. I point to the most explicit case -- homozygotes for xeroderma pigmentosum -- as an extreme example of a genetic lack of repair enzymes; we are bound to find other kinds of mutants with intermediate competence; and we have to wonder about interactions with repair-enzyme-inhibitors (caffeine?) and with virus infections that may interact with chromosome breaks. So I am morally certain we are so far seeing only the tip of the iceberg in radiation effects on human biology. We can properly use the existing background, and its fluctuations, as one standard for "safe" r-doses: this would be 10 times lower than the standard "doubling dose" now advocated as a standard, and has very little application to internal decay as from C-14, H-3 or ? Y-90.

Yours sincerely,

Joshua Lederberg  
Professor of Genetics

P.S. Need I reassure you that my scientific correspondence is off the record.

LT. J. P. KENNEDY, JR. LABORATORIES FOR MOLECULAR MEDICINE, DEDICATED TO RESEARCH IN MENTAL RETARDATION

MOLECULAR BIOLOGY

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DEVELOPMENTAL MEDICINE

P.S. I hope you are well and happy.

SEABORG